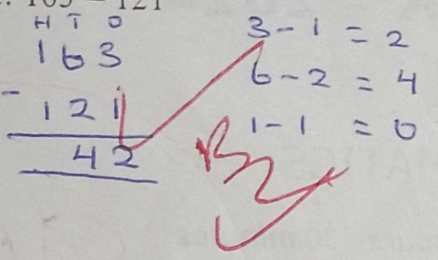
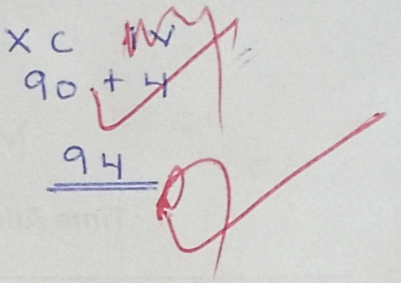
SECTION A: 40 MARKS

Questions 1 to 20 carry two marks each.

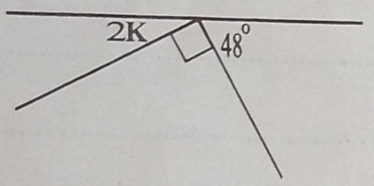
1. Workout: 163 − 121



2. Write XCIV in Hindu Arabic numerals.



3. Find the value of **K** in the figure below.



$2k + 90° + 48° = 180°$

$2k + 138° = 180°$

$2k + 138° - 138° = 180° - 138°$

$2k = 42°$

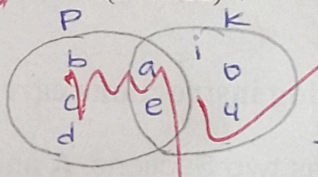
$\frac{2k}{2} = \frac{42^{21}}{1}$

$k = 21°$

4. List all factors of 24.

$F_{24} = \{1, 2, 3, 4, 6, 8, 12, 24\}$

5. Given that Set **P** = {a, b, c, d, e}
and Set **K** = {a, e, i, o, u}
Find $n(P \cap K)'$.



$(P \cap K)' = \{b, c, d, i, o, u\}$

$n(P \cap K)' = 6$

6. The cost price for a packet of a blue pen is Shs.13,500/= and its selling price is Shs.36,000/=. The selling price of 9 pens is equal to the cost price of a complete packet. Find the number of pens contained in the packet.

9 pens → Sh. 13,500/=

1 pen → Sh. (13500 ÷ 9)/=

Sh. 1500/=

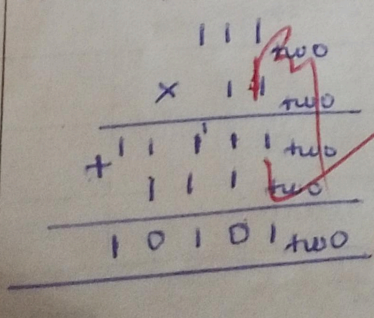
1 pen → Sh. 1500/=

Sh. 36000/=

Sh. 1500 × 24/1

24 pens

7. Multiply 111_{two} by 11_{two}.



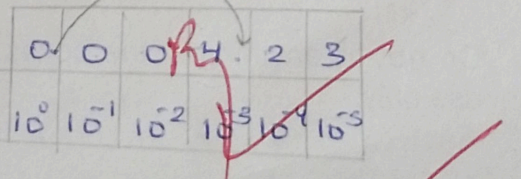
1 + 0 = 1

1 + 1 = 2/2 = 1 r 0

1 + 1 + 1 = 3/2 = 1 r 1

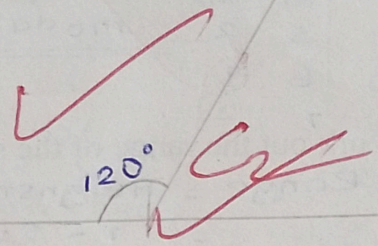
1 + 1 = 2/2 = 1 r 0

8. Express 0.00423 in scientific notation.



4.23×10^{-3}

9. Using a ruler, a sharp pencil and a protractor only. Draw an angle of 120^0 in the space below.



10. (i) Work out (214 × 53) + (47 × 214) using distributive property.

214(47 + 53)
214 × 100
= 21400

(ii) Given that a = +8, b = 5 and C = −3. Find C + a − b.

C + a − b
−3 + +8 − 5
−3 + (+8) − 5

−3 + 8 − 5
+5 − 5
0

11. Solve: $\frac{3}{5}n + 4 = 10$

$\frac{3}{5}n + 4 = 10$
$\frac{3n}{5} + 4 - 4 = 10 - 4$
$\frac{3n}{5} = 6$

$5 \times \frac{3n}{5} = 6 \times 5$
$3n = 30$
$\frac{3n}{3} = \frac{30}{3}$
$n = 10$

12. A circular pond is 20 metres wide. Calculate the distance around the pond (Use π as 3.14)

$P = \pi D$
$P = 3.14 \times 20m$
$P = \frac{314}{100} \times \frac{20}{1} m$
$P = \frac{6280}{100}$
$P = 62.8m$

13. Wasswa received a loan of Shs.600,000/= from Kato. He promised to pay it back after 4 months at an interest rate of 4% per month. How much money did he pay back at the end of the period?

S.I = P × R × T
= Sh 600,000 × 4 × 4
200 100 1
= Sh. 8000/=

4 Per month

Amount = P + I
= Sh. 600,000/=
+ Sh. 8,000/=
Sh. 608,000/=

14. Express 0.4666... as a common fraction in its simplest form.

Let the number be x
$x = 0.4666...$
$10x = 10 \times 0.4666...$
$10x = 4.666...$
$100x = 100 \times 0.4666$

$100x = 46.666...$
$-10x = 4.666...$
$90x = 42.000$
$\frac{90x}{90} = \frac{42}{90}$
$x = \frac{7}{15}$

15. Express 30 metres per second to kilometres per hour.

$\left(\frac{30}{1} \times \frac{3600}{1000}\right) km/hr$
108 km/hr

16. A mathematical lesson that was to last 2½ hours was to begin at 9:00a.m. The examination delayed for ¾ hours the papers had not yet reached the examination centre. At what time did the examination end?

Ending time = starting time + Duration

Starting time
9:00
+ 0:45
9:45 am

9:45
+ 2:30
12:15 pm

17. The team leader recorded points scored by club members: 7, 5, 6, 7, 6, 5, 6

(i) What is the modality frequency of the scores?

M	MF
5	2
6	3
7	2

modality frequency is 3

(ii) Work out the range of the scores.

Range = Heighst − Lowest
= 7 − 5
= 2

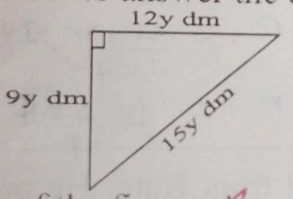
18. Counting numbers from 1 and 10 are written on cards and then put them in a box. What is the probability of selecting a prime number from them?

{1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
Prime numbers = {2, 3, 5, 7}
Probability = No. (E) / No (S)
= 4/10

19. In a party, 420 people use 140 litres of milk. How many litres of milk are needed by 600 people?

420 people → 140 litres
1 person → 140 ÷ 420 litres
→ 3 litres
600 people → (3 × 600) litres
1800 litres

20. Use the figure below to answer the questions that follow.



(i) Find the **area** of the figure above.

Area = ½ × b × h
= ½ × 9y dm × 12y dm
= ½ × 9y dm × 12y dm
= 54y dm²

(ii) What is the distance around the given figure?

P = 5 + 5 + 5
= 9y dm + 12y dm + 15y dm
= 36y dm

SECTION B: 60 MARKS

21. (a) Solve: 2(8 − X) = 4 (3 marks)

2(8 − x) = 4
16 − 2x = 4
16 − 16 − 2x = 4 − 16
−2x = −12
−2 −2
x = 6

(b) Simplify: −3(−m + 1) + 4(m + 2) (2 marks)

−3(−m + 1) + 4(m + 2)
+3m − 3 + 4m + 8
+3m + 4m + 8 − 3
7m + 5

12
15
9
36

22. In a fish factory, there are 20% more female workers than male workers. If female workers are 90;

(a) Calculate the population of the workers in the fish factory. (4 marks)

Let males workers be x

Female, male

$x + 20\%$, x

$x + 20\% + x = 100\%$

$x + x + 20\% - 20\% = 100\% - 20\%$

$2x = 80\%$

$x = 40\%$

Females

$x + 20\%$ but $x = 40\%$

$40\% + 20\% = 60\%$

$60\% \rightarrow 90$ workers

$1\% \rightarrow \frac{90}{60}$

$100\% \rightarrow \left(\frac{90}{60} \times 100\right)$ workers

150 workers

(b) How many less male workers than the female workers are in the fish factory? (2 marks)

$60\% - 40\%$

20%

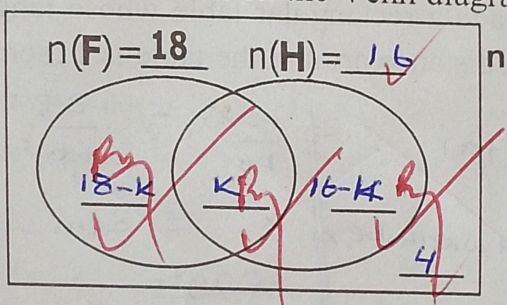
$1\% \rightarrow \frac{3}{2}$

$20\% \rightarrow \left(\frac{3}{2} \times 20\right)$ workers

30 less male workers

23. In a club, 18 members like Football n(**F**), 4 members dislike both games, (16 – **K**) like Hockey n(**H**) but not Football.

(a) Represent the above information on the Venn diagram below. (3 marks = ½ Mark each)



(b) If the number of members who don't like Football is 10. Find the members who like both games. (2 marks)

$16 - k + 4 = 10$

$16 + 4 - k = 10$

$20 - k = 10$

$20 - 20 - k = 10 - 20$

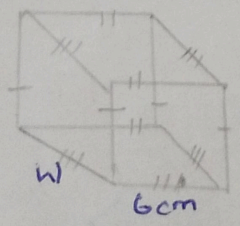
$-k = -10$

$+k = +10$

$k = 10$

24. A metallic rectangular tank has a length of 6cm and a height of 4cm. The length of all its edges sum up to 60cm.

(a) How wide is the tank? (3 marks)



$(4 \times L) + (4 \times h) + (4 \times w) = 60$

$(4 \times 6) + (4 \times 4) + (4 \times w) = 60$

$24 + 16 + 4w = 60$

$40 + 4w = 60$

$40 - 40 + 4w = 60 - 40$

$4w = 20$

$\frac{4w}{4} = \frac{20}{4} = 5$

$w = 5$ cm

(b) What is the capacity of the tank? (2 marks)

Volume = base area x height

$V = L \times W \times h$

$V = 6\text{cm} \times 5\text{cm} \times 4\text{cm}$

$V = 120\text{cm}^3$

1 litre → 1000cm^3

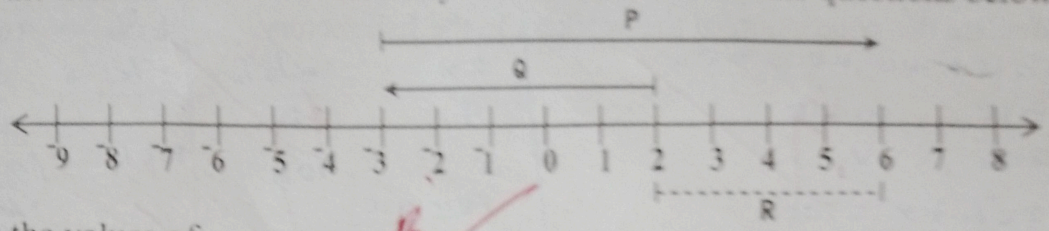
Capacity = volume

$= \left(\frac{120\text{cm}^3}{1000\text{cm}^3}\right)$ litres

$= \frac{12}{100}$ litres

$= 0.12$ litres

25. Study the number line below carefully and use it to answer the questions below.



(a) Write the values of: (1 mark each)

P +9

Q -5

R +4

(b) Write down the mathematical sentence shown on the number line. (2 marks)

Q + P = R

-5 + +9 = +4

26. Kajubi is a carpenter who made a rectangular table whose length and width are in the ratio of 5:3 respectively. The distance around the table is 128cm. How long and wide is the table he made? (4 marks)

Length : Width : Total

5 : 3 : 8

Let the length and width be x

5x

3x

2(L+W) = perime

2(5x + 3x) = 128cm

2(8x) = 128cm

16x = 128cm

16 16

x = 8cm

Length

5x but x = 8cm

5 x 8cm

40cm

Width

3x but x = 8cm

3 x 8cm

24cm

27. The distance from Kampala bus park to Mbarara is 275Km. A bus travelled from Kampala to Mbarara and then back to Kampala on the same day. The bus fare was Shs.40 per kilometre for every passenger and the capacity of the bus is 65 passengers.

(a) How much money does each passenger pay from Mbarara to Kampala? (3 marks)

1km → shs. 40

275km → shs. (40 x 275)

= shs. 11000

(b) Calculate the amount of money the bus made if on each trip it carried its full capacity. (3 marks)

1 passenger → shs 11000

65 passengers → shs (65 x 11000)

shs 715000

shs (2 x 715000)

shs 1430000

28. Ssebi arrived in Uganda from the United Kingdom with the following currencies in his bag:
(i) US dollars ($) 500
(ii) Pound Sterling (£) 800
(iii) Kenya Shilling (**K.Shs**) 12,000

If the exchange rate in the forex bureau is as follows:

(i) 1 US dollar ($) costs Ug.Shs.3,600
(ii) 2 Pound Sterling (£) costs Ug.Shs.8,000
(iii) 1 Kenya Shilling (**K.Shs**) costs Ug.Shs.40

How much money in Uganda Shillings did he have in his bag? (4 marks)

usdollar

ugshs.(500×3,600) + ugshs(800×8,000) + ugshs(12,000×40)

ugshs. 18000000 + ugshs. 64000000 + ugsh. 480000

ugshs. 86800000

D2

29. In Koko P/s, 200 candidates sat for P.L.E of 2023 whereby $^2/_5$ of the candidates were boys and the rest were girls. If an eighth of the girls passed and a quarter of the boys failed the examination. How many candidates passed the 2023 examinations? (4 marks)

Boys

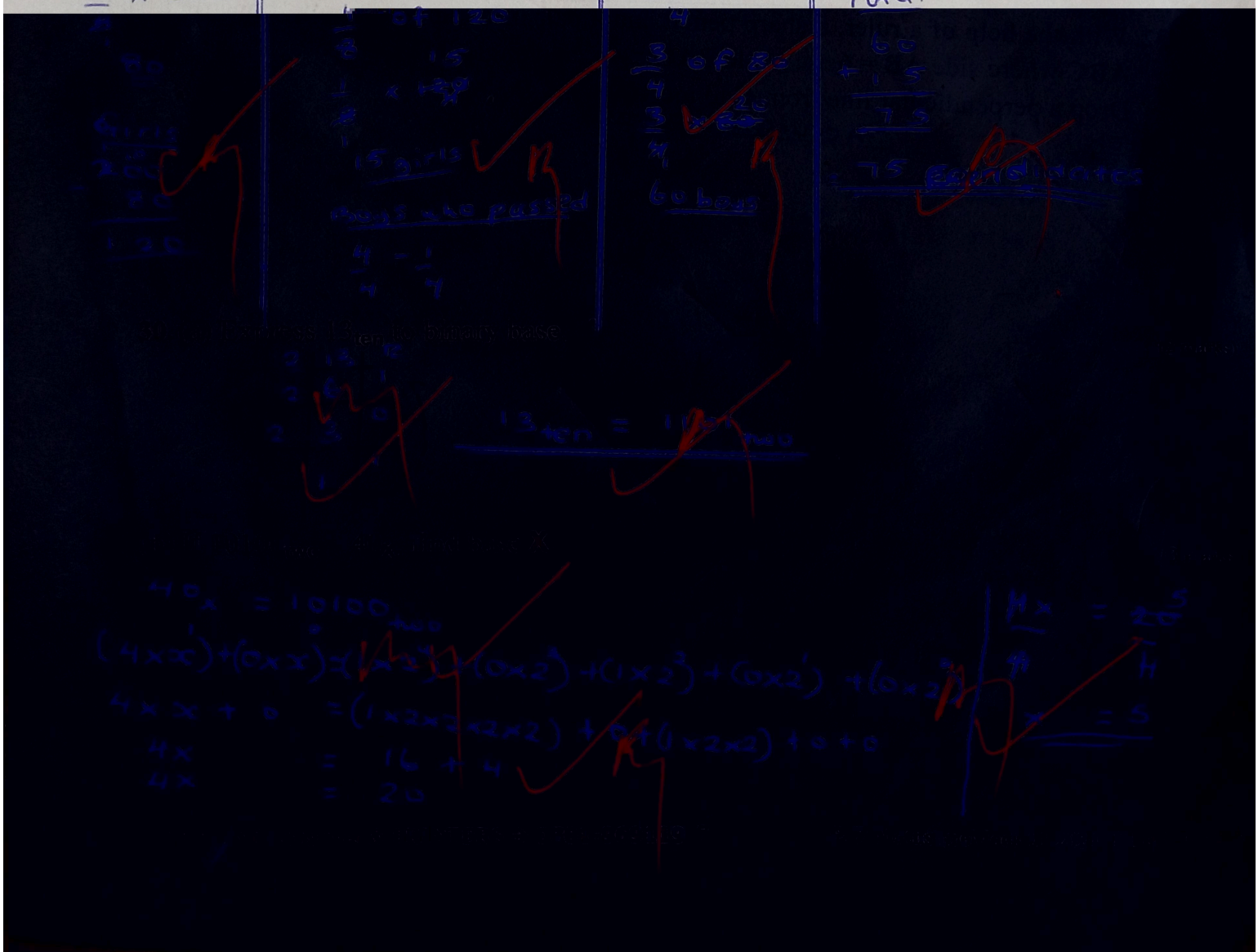
$\frac{2}{5} \times 200$ 40

Girls who passed

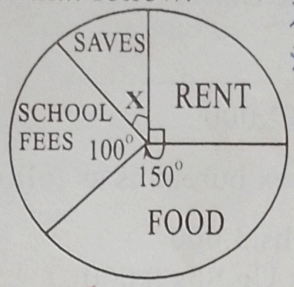
Total

60
+15
75

75 candidates



31. The pie-chart represents the expenditure and savings of Zizinga in Uganda Shillings.
Use it to answer the questions that follow.



$x + 90° + 150° + 100° = 360°$
$x + 340° = 360°$
$x + 340° - 340° = 360° - 340°$
$x = 20°$

(a) If Zizinga saves Shs.200,000/=, find his income. (3 marks)

$20° \rightarrow$ shs. 200,000/=
$1° \rightarrow$ shs $\frac{200,000}{20}$
$= shs.\ 10000/=$

$360° \rightarrow shs\ (360 \times 10000)/=$
$Sh.\ 3600000/=$

(b) What percentage of his income does he spend on Rent? (2 marks)

$360°$
$90°$
$340°$

$\frac{90}{360} \times 100\%$
$\frac{1}{4} \times 25\%$
25%

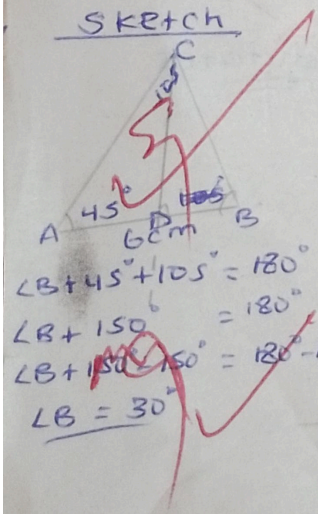
(c) By how many more shillings does he spends on Food than on Fees? (2 marks)

$150° - 100°$
$50°$

$1° \rightarrow shs\ 10000/=$
$50° \rightarrow shs.\ (10000 \times 50)$
$shs.\ 500000/=$

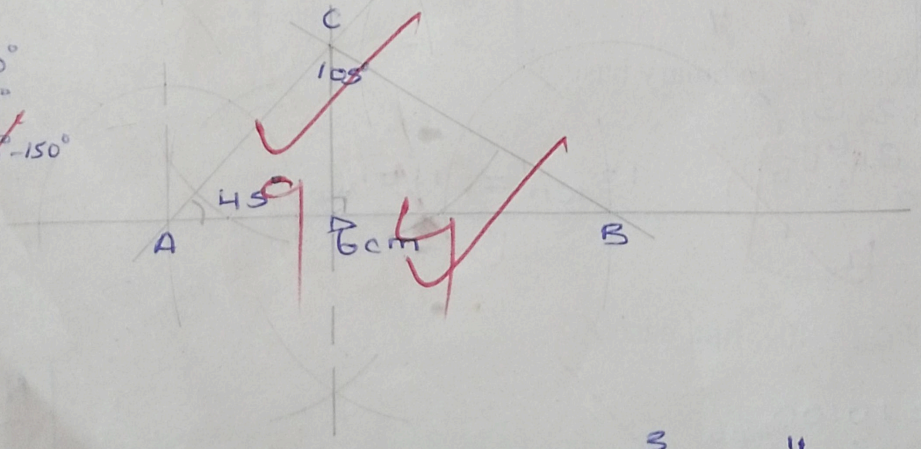
32. With the help of a ruler, a sharp pencil and a pair of compasses only, construct triangle **ABC** where side **AB** = 6cm, angle **BAC** = 45^0 and angle **BCA** = 105^0.
Drop a perpendicular line from **C** to meet **AB** and **D**. (4 marks)

Sketch



$\angle B + 45° + 105° = 180°$
$\angle B + 150° = 180°$
$\angle B + 150° - 150° = 180° - 150°$
$\angle B = 30°$

Accurate diagram



(b) Calculate the area of triangle **ABC**. (1 marks)

$Area = \frac{1}{2} \times b \times h$
$= \frac{1}{2} \times 6\,cm \times 2{\cdot}2\,cm$
$= \frac{1}{2} \times 6\,cm \times 2\frac{2}{5}\,cm$
$= 6\frac{3}{5}\,cm^2$